

In the Claims

Please amend the claim 1 and add new claims 2-8 as follows:

1. (Currently Amended) An apparatus for producing ~~the a~~ sequence of terahertz electromagnetic pulses by a driven particle beam comprising an ~~initial~~ electromagnetic beam (~~em-beam~~) is ~~sent~~ transmitted into a metal-dielectric structure whereby said ~~em-~~ electromagnetic beam partially transforms into a delayed electromagnetic wave, and a beam of charged particles (~~ep-beam~~) is ~~sent~~ transmitted to said structure, and periodically deflected away from it and back, whereby the ~~partiele's~~ kinetic energy of the charged particles partially periodically transforms into energy of the delayed electromagnetic wave having the same phase-frequency's characteristics as transformed field of the ~~em-~~ electromagnetic beam, whereby the transformation of the electromagnetic beam and excitation of the electromagnetic wave by the beam of charged particles takes place within a defined spatial region, wherein said spatial region is localized within said metal-dielectric structure.
2. (New) The apparatus of claim 1 wherein the pulses are in the Terahertz band.
3. (New) The apparatus of claim 1 wherein said transforming means is a wave-guide structure having suitable geometric configuration and dielectric/metal properties.
4. (New) The apparatus of claim 1 further comprising a deflector which is driven by small voltage.
5. (New) Methods for producing periodic pulses of electromagnetic energy by accelerating charged particles so as to establish a positive net emission of electromagnetic radiation by providing a manipulating means for driving accelerated particles, a transforming means for transforming an initial electromagnetic beam into a delayed electromagnetic wave and converting the kinetic energy of the charged particles into electromagnetic energy of the delayed electromagnetic wave, wherein the steps of transforming and converting take place simultaneously in the same interaction region, which has been formed by a wave-guiding structure.